HENRY C. LIST
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
**NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET**
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION FOR AIR QUALITY
803 SCHENKEL LN
FRANKFORT KY 40601-1403

October 20, 2003

Brenda C. Johnson
U.S. EPA, Region 4
Air Planning Branch
61 Forsyth Street
Atlanta, Georgia 30303

Dear Ms Johnson:

The purpose of this letter is to request your approval to use an alternative model for the re-designation of that portion of Boyd County that is currently classified as $SO_2$ non-attainment. As you know, the Guideline on Air Quality Models (GAQM) specifies criteria which a Regional Administrator should use to determine that an alternative model is more appropriate than a model listed in Appendix A of the GAQM for a specific application.

According to Section 3.2.2.e of the revised GAQM, "an alternative refined model may be used provided that:

i. The model can be demonstrated to be applicable to the problem on a theoretical basis; and
ii. The databases which are necessary to perform the analysis are available and adequate; and
iii. Performance evaluations of the model in similar circumstances have shown that the model is not biased toward underestimates; or
iv. After consultation with the EPA Regional Office, a second model is selected as a baseline or reference point for performance and the interim procedures protocol are then used to demonstrate that the proposed model performs better than the reference model.

The Kentucky Division for Air Quality believes that the AERMOD model, first proposed at the Seventh Annual Modeling Conference with subsequent amendments resulting in the current version 02222, meets the above listed provisions. AERMOD is a dispersion model developed by a working group comprised of three American Meteorological Society (AMS) scientists and four Environmental Protection Agency scientists. In the April 21, 2000, *Federal Register*, the EPA proposed to revise the GAQM and replace the Industrial Source Complex (ISC) model with AERMOD as a state-of-the-art practice technique for many air quality impact assessments. The ARMOD air dispersion model contains more sophisticated dispersion algorithms and can incorporate more detailed and available meteorological data than current versions of the ISCST3 air dispersion model. The following paragraphs address each provision of Section 3.2.2.e and describe the reasons why AERMOD, as the alternative model, should be used for the Boyd county re-designation exercise.

*The model can be demonstrated to be applicable to the problem on a theoretical basis.*

The April 21, 2000, Federal Register notice states that AERMOD is appropriate for the following applications:

Point, volume, and area sources;
Surface, near surface, and elevated releases;
Rural or urban areas;
Simple and complex terrain;
Transport distances over which steady-state assumptions are appropriate, up to 50km;
One (1) hour to annual averaging times.

*The databases that are necessary to perform the analysis are available and adequate.*

Adequate databases to perform the model are readily available. The meteorological database for the AERMOD air dispersion model will be that data collected at the Cooper School tower in Kentucky near the Marathon Ashland refinery in 1991. Also, the Cooper School data was combined with temperature, cloud cover and upper air measurements from the Huntington/ Tri-State Airport West Virginia NWS station. U.S. EPA approved criteria was used to demonstrate the adequacy and representativeness of the selected meteorological database.

*Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates.*

The performance evaluations of AERMOD indicate results that are nearly unbiased, on average, across all averaging times. For all averaging times in general and in most specific cases, AERMOD's performance was better than that of ISCST3.

The Kentucky Division for Air Quality is requesting that your agency concur with our determination that AERMOD is the appropriate alternative model to use for re-designation and approve its use. If you have any questions regarding this matter, please contact Mr. Stuart Ecton or Ms. Lona Brewer at 502-573-3383.

Sincerely,

John S. Lyons
Director

JSL:sde